

WHAT IS CLAIMED IS:

1. An electronic circuit module comprising:  
a circuit board having a recess in a surface of the  
5 circuit board;  
lands which are arranged on the surface of the circuit  
board and a bottom surface of the recess; and  
electronic components which are soldered on the lands.
- 10 2. The electronic circuit module according to claim 1,  
wherein the electronic components are surface-mount  
electronic components.
3. The electronic circuit module according to claim 1,  
15 wherein the circuit board is a multi-layer assembly.
4. The electronic circuit module according to claim 2,  
wherein the surface-mount electronic components include chip  
components which are soldered to the lands on the surface of  
20 the circuit board and a flip chip IC which is soldered to  
the lands on the bottom surface of the recess.
5. The electronic circuit module according to claim 4,  
wherein the flip chip IC is a BGA type or a BCC type.
- 25 6. The electronic circuit module according to claim 1,  
wherein at least one of electronic components is  
soldered to the lands on the bottom surface of the at least

one of a packaged semiconductor integrated circuit and a passive chip component.

7. The electronic circuit module according to claim 1,  
5 wherein the soldering is reflow-soldering.

8. The electronic circuit module according to claim 7,  
wherein all of the electronic components are reflow-soldered  
in a single operation.

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9. The electronic circuit module according to claim 2,  
wherein the surface-mount electronic components include chip  
components which are soldered to the lands on the surface of  
the circuit board and a packaged electronic component which  
15 is soldered to the lands on the bottom surface of the recess.

10. The electronic circuit module according to claim 2,  
wherein the circuit board has a substrate comprised of one  
of an alumina, a ceramic and a glass-epoxy material.

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11. The electronic circuit module according to claim 9,  
wherein the packaged electronic component comprises at least  
a plurality of passive electronic components.

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12. The electronic circuit module according to claim 9,  
wherein the packaged electronic component comprises at least  
one active electronic component.

13. A circuit board comprising:  
a substrate having a recess in a top surface surface  
thereof; and

lands which are arranged on the surface of the substrate  
5 and on a bottom surface of the recess.

14. The circuit board as in claim 13, wherein a depth of  
the recess is substantially equal to a height difference  
between a first component to be mounted on the top surface  
10 of the substrate and a second component to be mounted on the  
bottom surface of the recess.

15. The circuit board according to claim 13, wherein the  
substrate is comprised of one of an alumina, a ceramic and a  
15 glass-epoxy material.

16. The circuit board according to claim 15, wherein the  
substrate is comprised of multiple layers.

20 17. The circuit board according to claim 13, wherein the  
lands are dimensioned so as to permit attachment of  
components by reflow soldering.

18. The circuit board according to claim 13, further  
25 comprising:

connecting terminals disposed at on at least one of a  
side and a bottom surface of the substrate,  
wherein the connecting terminals are dimensioned so as

to permit attachment of the circuit board to a motherboard by reflow soldering.

19. A method for manufacturing an electronic circuit  
5 module comprising:

forming a recess in a surface of a circuit board;

providing lands on the surface of the circuit board and  
a bottom surface of the recess;

applying solder cream to each of the lands for which a  
10 reflow-soldered connection is to be made;

placing surface-mount electronic components on the lands  
with the solder cream interposed between each of the  
surface-mount electronic components and the corresponding  
lands; and

15 reflow-soldering the surface-mount electronic components  
to the corresponding lands.

20. The method according to claim 19, wherein the solder  
cream is applied to the lands by placing a metal mask on the  
20 surface of the circuit board, the metal mask having a flat  
top surface and a bottom surface provided with a projection,  
positioning the projection with respect to the recess,  
applying solder cream to the top surface of the metal mask,  
and spreading the solder cream over the top.

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21. The method according to claim 20, wherein the solder  
cream is applied to the lands on the surface of the circuit  
board and the lands on the bottom surface of the recess in

a single spreading operation.

22. The method according to claim 21, wherein all of the surface-mount components are reflow-soldered to the  
5 corresponding lands on the surface of the circuit board and the bottom surface of the recess in a single reflow soldering operation.

23. A solder mask comprising;  
10 a metal sheet having a flat upper surface;  
a protrusion in a bottom surface of the metal sheet corresponding in position to a recess formed in a surface of a substrate and sized such that the protrusion may be inserted in the recess; and  
15 apertures formed in the metal sheet,  
wherein the apertures are formed in positions corresponding to the location of lands on the surface of the substrate and lands on the bottom surface of the recess.

20 24. The solder mask according to claim 23, wherein the apertures are sized to permit a predetermined amount of solder cream to be applied to each land.

25 25. The solder mask according to claim 23, wherein a height of the protrusion is substantially equal to a depth of the recess.

26. The solder mask according to claim 23, wherein the

metal sheet is comprised of stainless steel.

27. An electronic circuit module having a reduced overall height comprising:

5       a substrate;

          means for connecting components to a printed wiring pattern; and

          means for recessing components below a top surface of the substrate.

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28. The electronic circuit module according to claim 27, having a means for connecting the printed wiring pattern to a motherboard.

15       29. A circuit board comprising:

          a substrate;

          means for mounting components at multiple heights with respect to a top surface of the substrate; and

          means for connecting the components to a wiring pattern.